

L 25511-66

ACC NR: AP6011401

2

the contribution from collisions of the second kind was predominant. As a function of the helium partial pressure, the population of the  $2s_2$  neon level went through a minimum at 1-2 mm Hg and a maximum at 4-6 mm Hg. The behavior of the  $1.15\mu$  ( $2s_2 - 2p_4$ ) neon line intensity as a function of helium pressure to be expected on the basis of the calculated populations is in agreement with the measurements of V.B.Znamenskiy. The authors thank Yu.M.Kagan for his interest and valuable remarks, and V.B.Znamenskiy for kindly making available the results of his measurements. Orig. art. has: 4 formulas, 9 figures and 2 tables.

SUB CODE: 20

SUBM DATE: 22May65

ORIG. REF: 007

OTH REF: 005

Card 3/3

PB

1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
PROCESSING AND PROPERTIES INDEX																			
<p>BC</p> <p style="text-align: right;">2-4</p> <p style="text-align: center;">Processing of metals by electrolysis (Compl. rend.                      Acad. Sci. USSR, 1964, No. 10, 1414-1415) The data submitted                      suggest that electrolysis of molten salts is an efficient method after several                      minutes is reduced to the minimum.</p>																			
ASR-SLA DETAILING LITERATURE CLASSIFICATION										1ST AND 2ND COLUMNS									
3RD AND 4TH COLUMNS										1ST AND 2ND COLUMNS									

1ST AND 2ND CROSET										3RD AND 4TH CROSET									
PROCESSES AND PROPERTIES INDEX																			
<p><i>BC</i></p> <p><i>Q-4</i></p> <p><i>Stages of metal products in Japan. A. V. Labin (Compt. rend. Acad. Sci. Paris, 1964, 274, 1-10). A study of the annual changes in the metallurgical industry of Japan. J. D. B.</i></p>																			
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>SECTION 1</p>										<p>SECTION 2</p>									
<p>SECTION 3</p>										<p>SECTION 4</p>									

LUKINE, A. V.

Mem., Tartar Sect. Ichthyological and Fresh-Water Pisciculture Inst., Kazan, -1941-.

"The Frequency of Spawn in the Sterlet," Dok. AN, 32, No. 2, 1941;

"The Stages of Sexual Maturity in the Sterlet,"

SO: Dok. AN, 32 No. 5, 1941.

LUKIN, A. V.

Lukin, A. V. - "Investigations of the status of supplies of sturgeon in the central Volga after the floods of 1939 through 1942", Trudy Tatar. otd-niya Vsesoyuz. nauch.-issled. in-ta ozerno-rech. ryb. khoz-va, Issue 4, 1943, p. 3-30, - Bibliog: 22 items.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

LUKIN, A. V.

Lukin, A. V. - "The fish company of the Sura River within the boundaries of the Chuvash ASSR", Trudy T tar. otd-niya Vsesoyuz. nauch.-issled. in-ta ozernorech. ryb. khoz-va, Issue 4, 1948, p. 31-97, - Bibliog: 33 items.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

LUKIN, A.V.

Age of sexual maturity and longevity of fishes as a factor in  
their struggle for existence. Izv.Kazan.fil.AN SSSR.Ser.biol.1  
sel'khoz.nauk no.1:63-79 '49. (MLRA 10:2)  
(Volga River--Fishes)

LUKIN, A.V.

Role of temperature in the adaptation of the fish organism to the environmental conditions most favorable for reproduction. Izv.

Kazan.fil.AN SSSR.Ser.biol.i sel'khoz.nauk no.1:81-86 '49.

(Volga River--Fishes)

(MLBA 10:2)

(Temperature--Physiological effect)



LUKIN, A.V.; SHTEYNFEL'D, A.L.

Fertility of main commercial fishes of the middle Volga. Izv.Kazan.  
fil.AN SSSR.Ser.biol.i sel'khoz.nauk n°.1:87-106 '49. (MLRA 10:2)  
(Volga River--Fishes)

LUKIN, A. V.

"Relationship of the Fertility and Spawning Characteristics of Fish to their Habitat."

SO: Iz. Ak. Nauk SSSR, Ser. Biolog., 5, 1948., Mhr., Biology Inst, Kazan Affiliate, Acad. Sci., -c. 1948..

"The Spawning of Fishes of the Central Volga," Priroda, No. 11, 1949.

LUKIN, A.V.; VASYANIN, K.I.; POPOV, Yu.K.

Inferior and undesirable fishes of the Tatar Republic, their significance in fishery and means for their economic utilization. Izv.Kazan. fil.AN SSSR.Ser.biol.i sel'khoz.nauk no.2:259-292 '50. (ILRA 10:2)  
(Tatar A.S.S.R.--Fishes)

1. LUKIN, A. V. - Prof.
2. USSR (600)
4. Fish Culture
7. Standards and periods for fish feeding. Ryb. khoz. 28, no. 10, 1952.
9. Monthly List of Russian Accessions, Library of Congress, January, 1953. Unclassified.

LUKIN, A.V., professor.

Measures for building up a desirable fish stock in Kuybyshev  
Reservoir. Uch.zap.Kaz. un. 113 no.1:175-178 '53.

(Kuybyshev Reservoir--Fishes)

(MLRA 10:3)

LUKIN, A.V., doktor biologicheskikh nauk.

Ways for controlled developemtn of the ichthyofauna in re-  
servoirs. Trudy sov.ikht.kom. no.3:21-26 '54. (MIRA 7:8)

1. Tatarskoye otdeleniye Vsesoyuznogo nauchno-issledovatel'skogo  
instituta ozenogo i rechnogo rybnogo khozyaystva.  
(Fishes)

LUKIN, A.V.

ARISTOVSKAYA, G.V.; LUKIN, A.V.

Raising young-of-the-year Kama carp in hatchery ponds. Uch.zap.  
Kaz.un. 115 no.8:191-204 '55. (MLRA 10:3)

1. Deystvitel'nyy chlen Obshchestva yestestvoispytateley.  
(Carp)

LUKIN, A.V.

Basic characteristics of the development of fish stock in Kuybyshev  
Reservoir. Vop. ekol. 5:118-119 '62. (MIRA 16:6)

1. Tatarskoye otdeleniye Gosudarstvennogo nauchno-issledovatel'skogo  
instituta ozernogo i rechnogo rybnogo khozyaystva.  
(Kuybyshev Reservoir--Fishes)



YERMAKOV, B.A.; LUKIN, A.V.; MAK, A.A.; PRIJEZHAYEV, D.S.

Monopulse generation on  $\text{CaF}_2:\text{U}^{3+}$  crystals. Pis'. v red. zhur.  
eksper. i teoret. fiz. 2 no.8:380-383 O '65.

(MIRA 18:12)

1. Submitted August 31, 1965.

ACC NR: AP7008136

SOURCE CODE: UR/0057/67/037/002/0327/0329

AUTHORS: Afanas'yeva, V.L.; Lukin, A.V.; Mustafin, K.S.

ORG: none

TITLE: Energy distribution of electrons in a hollow cathode discharge in a neon-hydrogen mixture

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 37, no.2, 1967, 327-329

TOPIC TAGS: gas laser, neon, hydrogen, population inversion, electron distribution, energy distribution, *cathode discharge, discharge tube*

ABSTRACT: The authors have measured the energy distribution of electrons in hollow cathode discharges in neon and in a neon-hydrogen mixture. The measurements were undertaken in the search for an explanation for the difference between the behaviors of hydrogen and oxygen as quenching agents for the production of population inversion for the  $2s \rightarrow 2p$  transitions in neon lasers. The apparatus and experimental technique have been described elsewhere by the authors (ZhTF, 36, 526, 1966). The discharge tube was 1.2 cm in diameter and 30 cm long; the distance between the anodes was 10 cm. The total gas pressure was 1.1 mm Hg in both series of measurements, and when hydrogen was present its partial pressure was 0.3 mm Hg. The discharge current was varied from 0.05 to 0.4 A and the electron energy distribution function was recorded for electron energies up to 40 eV. In pure neon the electron energy distribution function decreased

Card 1/2

UDC: 533.933

ACC NR: AP7008136

monotonically from its first (and only) maximum at about 1.5 eV. In the neon-hydrogen mixture, however, the distribution function had a second maximum at about 20 eV and a corresponding minimum at about 16 eV when the discharge current was sufficiently high. The measured electron energy distribution functions were employed to calculate the populations of the  $1s_5$ ,  $2s_2$ , and  $2p_4$  neon levels, and the results are tabulated. The calculations indicated that in pure neon the  $2p_4$  level is highly populated by step-wise excitation and there is no population inversion for the  $2s_2 + 2p_4$  transition, but that the presence of hydrogen depresses the  $1s_5$  and  $2p_4$  populations and enhances the  $2s_2$  population, producing the population inversion. It is concluded that the presence of the second maximum in the electron energy distribution function in the neon-hydrogen mixture results in an increase in the population of the  $2s$  neon levels and accounts for the advantage of hydrogen over oxygen as a quenching agent in neon lasers. The rapid rise of the lasing level of a neon-hydrogen laser with increasing discharge current is ascribed to the increase with increasing discharge current of the height of the second maximum of the electron energy distribution function. Orig. art. has: 1 formula, 2 figures and 1 table. [WA-14] [15]

SUB CODE: 20 / SUBM DATE: 03Dec65/ ORIG. REF: 005/ OTH REF: 001/

Card 2/2

LUKIN, A.V., inzh.

Siberian larch in protective belt planting. Put' 1 put. Khaz.  
9 no. 7:29 '65. (MIRA 18:10)

LUKIN, A.V.

Dendrological treasures of the "Urusovo" park. Biul.  
Glav. bot. sada no.55:30-31 '64. (MIRA 18:11)

1. Chaplyginskoye lesnoye khozyaystvo, selo Troyekurovo  
Lipetskoy oblasti.

L 7691-66 EWA(k)/FBD/EWT(1)/EWT(m)/EPF(c)/EEC(k)-2/T/EWP(t)/EWP(k)/EWP(b)/  
EWA(m)-2/EWA(h) SCTB/IJP(c) WD/JD/JW

ACC NR: AP5028019

SOURCE CODE: UR/0386/65/002/008/0380/0383

AUTHOR: Yermakov, B. A.<sup>44</sup>; Lukin, A. V.<sup>44</sup>; Mak, A. A.<sup>44</sup>; Prilezhayev, D. S.<sup>44</sup>

ORG: none

TITLE: Monopulse generation with  $\text{CaF}_2:\text{U}^{3+}$  crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 8, 1965, 380-383

TOPIC TAGS: solid state laser, laser pulsations, laser

ABSTRACT: This is a continuation of earlier work (Optika i spektroskopiya v. 18, 353, 1965) in which attainment of monopulse generation in the  $2.36\mu$  infrared region with  $\text{CaF}_2:\text{Dy}^{2+}$  was reported. In the present paper the authors report attainment of monopulse generation with  $\text{CaF}_2:\text{U}^{3+}$  crystals at wavelengths  $2.22$  and  $2.51\mu$ , using an experimental set up in which the crystals are cooled to  $80-90\text{K}$  by a jet of nitrogen gas evaporated from the liquid phase (Fig. 1). A semitransparent coating with reflection coefficient  $R = 0.95 \pm 0.6$  was deposited on one end of the crystal. The cavity switching was by means of a rotating total internal-reflection prism. The pump-lamp ignition was synchronized with a photoelectric system coupled to the prism rotating at  $1-2 \times 10^4$  rpm. The crystals used were  $3-55$  mm in diameter and  $20-30$  mm long. The radiation receiver was a Ge: Au photoresistance, and the generated energy was measured with a bolometer. The monopulse lasing at  $\lambda_0 = 2.22\mu$  was of the three-level type (Fig. 2a), with emission energy  $0.1 \times 10^{-3}$  J, corresponding to a pulse power of

Card 1/3

L 7691-66

ACC NR: AP5028019

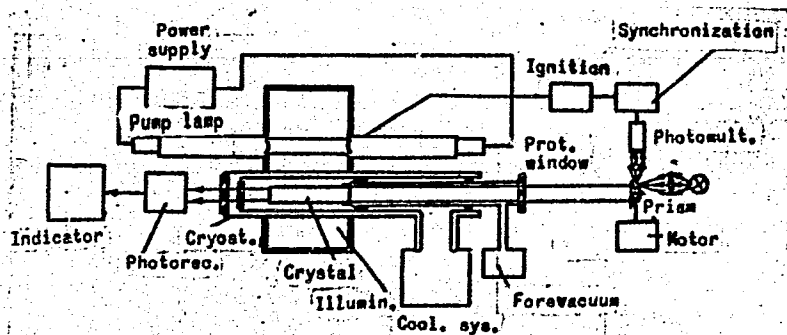


Fig. 1. Experimental setup

$\sim 4 \times 10^3$  W. In several crystals monopulse 4-level generation ( $\lambda_4 = 2.51 \mu$ ) was obtained, apparently, because of the high concentration of the activator in these crystals. The shape of the pulse was the same as in Fig. 2a. The maximum laser energy in the monopulse was  $10^{-3}$  J in this case (pulse power  $\sim 5 \times 10^4$  W). At smaller prism

Card 2/3

L 7691-66

ACC NR: AP5028019

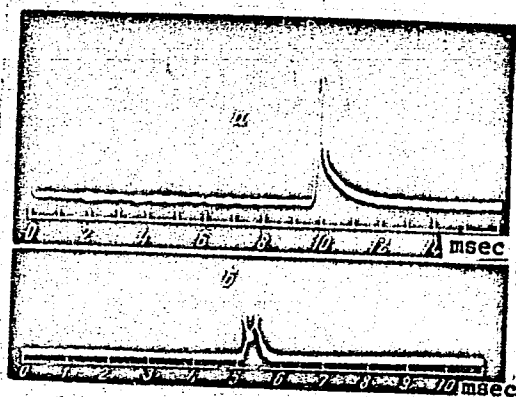


Fig. 2. Monopulse oscillograms

speeds, several laser pulses were obtained rather than one (Fig. 2b). Orig. art. has: 2 figures. [02]

SUB CODE: EC/ SUBM DATE: 31Aug65/ ORIG REF: 002/ ATD PRESS: 4141

Card

3/3



L 27779-66 EEC(k)-2/ENA(h)/ENP(j)/ENP(k)/ENT(l)/ENT(m)/FBD/T/ENP(e) IJP(c)

ACC NR: AP6015592

RM/WH/WG

SOURCE CODE: UR/0368/66/004/005/0410/0414

AUTHOR: Yermakov, B. A.; Lukin, A. V.

53  
49  
B

ORG: none

TITLE: Mechanism responsible for clearing of organic phototropic shutters used in ruby lasers

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 5, 1966, 410-414

TOPIC TAGS: ruby laser, phthalocyanine, phototropism, light absorption

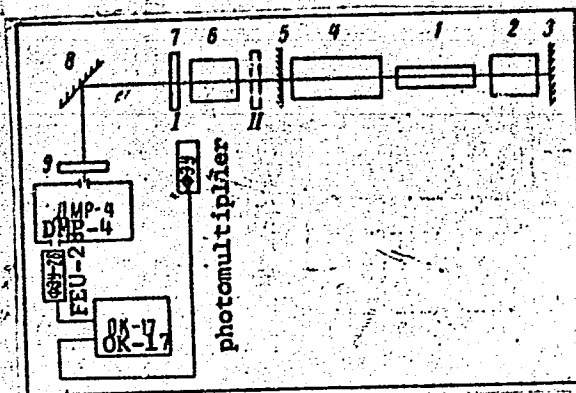
ABSTRACT: The authors consider reversible bleaching absorption under the effect of powerful light pulses through a solution of vanadyl phthalocyanine in nitrobenzene on two wavelengths lying within the absorption band for this solution. A block diagram of the experimental setup is shown in the figure. In the resonator of the ruby laser were a bleachable absorber (a solution of kryptocyanine in methanol) and a cell filled with benzene. Emission took place on wavelengths 649.3 mμ and 745 mμ (due to stimulated Raman scattering in benzene). The energy of the pulse on λ=745 mμ was about 15% of the energy on the ruby laser output. Monochromatic pulses were directed toward cell 6 with the solution to be studied through an attenuating filter selected in such a way that the intensity of emission on 745 mμ is insufficient to pass through the solution. The

UDC: 621.375.9

Card 1/3

L 27779-66

ACC NR: AP6015592



1--ruby crystal; 2--phototropic shutter;  
3--opaque mirror; 4--cell with benzene;  
5--output mirrors; 6--cell with solution  
to be studied; 7, 9--set of light filters;  
8--rotating mirror

radiation passing through cell 6 and set of neutral filters 7 was directed to the input slit of monochromator DMR-4 tuned to a wavelength of 745 mμ. An FEU-28 photomultiplier was placed behind the output slit of the monochromator and the signal from the photo tube was recorded by an OK-17M oscil-

lograph. When the set of neutral filters was placed in front of the cell (position II) and the emission intensity on  $\lambda=694.3$  mμ was not sufficient to pass through the solution, a pulse was recorded on  $\lambda=745$  mμ with an amplitude of 1/2-1/3 that of the pulse produced when the solution was exposed to radiation with  $\lambda=694.3$  mμ with the set of filters 7 in position I. The results showed clearing of phthalocyanine solutions throughout the entire absorption band during exposure to intense monochromatic radiation. A theoretical explanation is given for the clearing effect based on changes in population in a three-level model for the solution. This three-level model for

Card 2/3

L 27779-66

ACC NR: AP6015592

4

phototropic substances may be used to determine the effect which spectroscopic characteristics of materials have on their efficiency as laser shutters which is important for synthesis or selection of materials for this purpose. In conclusion the authors thank I. F. Balashov, A. A. Mak and D. S. Prilezhayev for discussing the work and L. S. Dovgan for assistance with the calculations. Orig. art. has: 4 figures. [14]

SUB CODE: 20/ SUBM DATE: 03Jan66/ ORIG REF: 003/ OTH REF: 005/  
ATD PRESS: 5103

Card 3/3

L 27727-66 EWT(m)/EWP(j) RM/WH

ACC NR: AP6015435

SOURCE CODE: UR/0051/66/020/045/0903/0905

AUTHOR: Dovger, L. S.; Yermakov, B. A.; Lukin, A. V.; Shklover, L. P.

ORG: none

TITLE: Effect of stimulated emission on the transmission coefficient of some organic dye/solution

SOURCE: Optika i spektroskopiya, v. 20, no. 5, 1966, 903-905

TOPIC TAGS: ruby laser, stimulated emission, optic transmission, dye chemical, organic cyanate compound

ABSTRACT: Experiments are conducted to determine how much emission power density is required in the resonator of a ruby laser for transillumination of various organic solutions. A block diagram and brief description of the experimental equipment are given. Curves are also given showing the transmission coefficient as a function of incident radiation power for solutions of vanadyl phthalocyanine in dimethyl formamide, kryptocyanine in methanol, vanadyl phthalocyanine in nitrobenzene and zirconium phthalocyanine in  $\alpha$ -bromonaphthalene. These curves show that transmission of the specimens approaches 100% at a power density of the order of several  $\text{Mw/cm}^2$  which corresponds to energy densities of  $10^{17}$  quanta/ $\text{cm}^2$  in a period of  $10^{-8}$  sec. This indicates that transillumination of specimens in this class is basically due to transi-

Card 1/2

UDC: 621.375.9 : 535.004.14

L 27727-66

ACC NR: AP6015435

2  
tions from ground energy levels to singlet states with lifetimes of the order of  $(2-8) \cdot 10^{-9}$  sec. A reduction in solution concentration (increase in initial transmission) shifts the curve toward lower power densities without changing its shape. In conclusion the authors thank A. N. Terenin and O. D. Dmitriyevskiy for interest in the work. Orig. art. has: 3 figures. [14]

SUB CODE: 20/

SUBM DATE: 25Jun65/

ORIG REF: 001/

OTH REF: 003/

ATD PRESS: 5002

Card 2/2

BLE

LUKIN, A. Ya.

"Volcanic Deposits of the Miocene Epoch in the Carpathians," Dok AN SSSR,  
83, No 5, 1952.

MIRA August 1952

LUKIN, A.Ya.

Mineralogical survey of terrigenous sediments of the lower Tortonian  
in the northwestern part of the outer zone of the cis-Carpathian frontal  
fault. Vop.min.osad.obr. 5:142-159 ' 58. (MIRA 12:3) .  
(Carpathian Mountain region--Mineralogy)

LUKIN, A.Ya.

Lithology of Tertonian deposits in the northwestern part of the  
outer zone of the cis-Carpathian frontal fault. Trudy VNIGNI no.12:  
69-79 '58. (MIRA 12:3)  
(Carpathian Mountain region--Petrology)



LUKIN, A.Ya.

Lithology of Pistyn' conglomerates in the cis-Carpathian region.  
Trudy UkrNIGRI no.1:57-67 '59. (MIRA 12:12)  
(Carpathian Mountain region--Conglomerates)

LUKIN, [A.Ya.]

"An Experiment with the Liquidation of Foot-and-Mouth Disease in its Incipient Stages. Brands (in Ukrainian). Vet. sprava, 1939, No 10. (Bibliography from article Foot and Mouth Disease by A. L. Skomorokhov, State Publishing House for Agricultural Literature, Moscow/Leningrad 1947.)

SO: U-1625, 11 January 1952,

**LUKIN, H-Ya.**

C4

PROCESSES AND PROPERTIES INDEX

12

Experiments in feeding hogs with toxic fodder. A.  
Ya. Lukin and M. G. Berlin. Veterinariya 23, No. 7,  
30-7(1946).--In connection with the attack of human  
septic angina through consumption of millet left to winter  
uncut in the field, feeding expts. were conducted on  
animals. Hogs were not harmed by the grain which  
was toxic to man; the work on feeding horses was only  
preliminary and not conclusive. B. Gutoff

AED-SLA METALLURGICAL LITERATURE CLASSIFICATION

STONY BROOK, N.Y.

RESEARCH ONE DIVISION

LUKIN, A. YA., PROF

PA 61T61

USSR/Medicine - Animals - Diseases  
Medicine - Beets

Jan 1948

"The Garden Beet as a Cause of Mass Poisoning of Swine, the Etiology of the Poisoning, and a Method of Treatment," Prof A. Ya. Lukin, 3 pp

"Veter" No 1

Use of methylene blue is recommended as radical means of treating methemoglobin resulting from nitrate poisoning. Doses for swine were 0.01-0.02 grams of methylene blue for each kilogram of weight of swine. Doses were administered in solution.

61T61

LUKIN, A.Ya. .

Mineralogy of the Buglovka layer of the southwestern margin of the  
Russian Platform. Trudy UkrNIGRI no.5:302-308 '63.

(MIRA 18:3)

LUKIN, A.Ye.

Epigenetic zoning of rocks of the Shigneta series in the Ona River  
area of the Western Sayan Mountains. Dokl. AN SSSR 151 no.1:  
178-180 J1 '63. (MIRA 16'9)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo.  
Predstavleno akademikom N.M.Strakhovym.  
(Sayan Mountains--Rocks)

GRITSENKO, A., gornyy master; KACHURA, A.; LUKIN, B.

Is there a need for special gas inspectors in mines? Sov.shakht.  
10 no.5:17 My '61. (MIRA 14:9)

1. Shakhta no.2 "Kontarnaya" tresta Shakterskantratsit." 2.  
Rabochiy shakhty no.8 kombinata Stalinugol'. 3. Desyatnik ventil-  
yatsii shakhty "Polysayevskaya-1" kombinata Kuzbassugol'.  
(Mine gases)

DMITRASHKO, I.; LUKIN, B.

Using a piecework bonus wage system on state farms. Biul. nauch.  
inform.: trud i zar. plata 5 no.2:45-50 '62. (MIRA 15:2)  
(Agricultural wages)



VERNYI, A.N. Prinsipial uchastiy: LUKIN, B.S., slesar'; MAMONTOVA, O.K.,  
red.; FILATOVA, G.M., tekhn. red.

[Automatic equipment for liqueur and vodka distilleries] Avtomati-  
cheskoe oborudovanie likero-vodochnykh zavodov; rukovodstvo po  
ekspluatatsii i naladke. Blagoveshchensk, Amurskoe knizhnoe izd-  
vo, 1960. 62 p. (MIRA 15:12)

1. Russia (1917- R.S.F.S.R.) Amurskiy ekonomicheskii administra-  
tivnyy rayon. Zavodoupravleniye spirtovodochnykh predpriyatiy.
2. Glavnyy inzhener zavodoupravleniya spirtovodochnykh predpri-  
yatiy Amurskogo sovnarkhoza (for Vernyy).

(Amur Province--Distilling industries--Equipment and supplies)  
(Machinery, Automatic)

**Ray investigation of the crystallization of vulcanized rubber on stretching.** B. V. Lukin and V. I. Kasatichkin. *J. Tech. Phys.* (U.S.S.R.) 16, 1383-8 (1946) (in Russian).  
The method of Ficht (C.A. 35, 2629, 8358) was used to det. by dehydrogram microphotometry the percentages of cryst. phase  $c$  in 4 samples of rubber vulcanized at 143° for varying lengths of time  $\tau$  (in min.), after stretching, as a function of  $r$ . Four samples (I-IV) were prepd. from a base mixt. of smoked sheet rubber 100, S 7, ZnO 5, stearic acid 2, without and with the addn. of mercaptan-3, benzothiazole 0.3, diphenylguanidine 0.378, and a thiuram accelerator 0.127, resp. The samples were stretched 600%, except III, which could be stretched only 500% only after  $\tau$  60 min., and IV, which was stretched 600% only after  $\tau$  5 min. Each of the 4 samples showed a max.  $c$  at a certain  $r$ , increasingly shorter in the order I, III, II, IV; the height of the max. increased in the order I, III, II (63, 71, 75%); for a given sample, it increases with the degree of stretching, but the position of the max. remained unchanged for a given sample;  $c$  fell to zero at  $r$  55 and 108 min. for 300% stretching and 100%, resp. Curves of tensile strength  $\sigma$  against  $r$  had a max. at about the same  $r$  as curves of  $c$  (100, 60, and 20 min. for I, III, and II, resp.). Stress-strain curves (II) show, for a given strain, stresses increased with further increase in  $r$ , after which they decreased with further increase in  $r$ . Curves of the ultimate elongation  $\epsilon$  of I and III had minima (at  $r$  10,  $r$  12%, and  $r$  15,  $r$  14%, resp.).

then maxima (at  $r$  30,  $r$  21, and  $r$  68,  $r$  25, resp.). The observations lead to the conclusion that, in addn. to progressive cross-linking, eventually resulting in prevention of crystn., oxidative destruction accompanying vulcanization takes place. The increase of  $c$  at its max. in the presence of accelerators is explained by the shorter  $\tau$  and correspondingly lesser accumulation of oxidation products; on the other hand, the observed reversal of the stress from  $r$  60 upwards, indicates increased plasticity due to such an accumulation. The fact that the decrease of  $c$  beyond the max. is the more marked the less the stretching is linked with a corresponding increase in creep, N. Thon inversely related to  $c$ .

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

18

**METHOD FOR SHORTENING THE EXPOSURE DURING THE TAKING OF X-RAY DIFFRACTION PHOTOGRAPHS.** B. V. Lukin. (Zavodskaya Laboratoriya, 1948, vol. 14, July, p. 553). (In Russian)

A modification of the usual arrangement for X-ray diffraction photography is briefly described, whereby the exposure can be reduced by as much as ten times. S.K.

ATM-51A METALLURGICAL LITERATURE CLASSIFICATION

SEARCHED	INDEXED	SERIALIZED	FILED
YES	YES	YES	YES

STANDARD NO. 1

STANDARD NO. 2

STANDARD NO. 3

STANDARD NO. 4

STANDARD NO. 5

STANDARD NO. 6

STANDARD NO. 7

STANDARD NO. 8

STANDARD NO. 9

STANDARD NO. 10

STANDARD NO. 11

STANDARD NO. 12

STANDARD NO. 13

STANDARD NO. 14

STANDARD NO. 15

STANDARD NO. 16

STANDARD NO. 17

STANDARD NO. 18

STANDARD NO. 19

STANDARD NO. 20

STANDARD NO. 21

STANDARD NO. 22

STANDARD NO. 23

STANDARD NO. 24

STANDARD NO. 25

STANDARD NO. 26

STANDARD NO. 27

STANDARD NO. 28

STANDARD NO. 29

STANDARD NO. 30

STANDARD NO. 31

STANDARD NO. 32

STANDARD NO. 33

STANDARD NO. 34

STANDARD NO. 35

STANDARD NO. 36

STANDARD NO. 37

STANDARD NO. 38

STANDARD NO. 39

STANDARD NO. 40

STANDARD NO. 41

STANDARD NO. 42

STANDARD NO. 43

STANDARD NO. 44

STANDARD NO. 45

STANDARD NO. 46

STANDARD NO. 47

STANDARD NO. 48

STANDARD NO. 49

STANDARD NO. 50

STANDARD NO. 51

STANDARD NO. 52

STANDARD NO. 53

STANDARD NO. 54

STANDARD NO. 55

STANDARD NO. 56

STANDARD NO. 57

STANDARD NO. 58

STANDARD NO. 59

STANDARD NO. 60

STANDARD NO. 61

STANDARD NO. 62

STANDARD NO. 63

STANDARD NO. 64

STANDARD NO. 65

STANDARD NO. 66

STANDARD NO. 67

STANDARD NO. 68

STANDARD NO. 69

STANDARD NO. 70

STANDARD NO. 71

STANDARD NO. 72

STANDARD NO. 73

STANDARD NO. 74

STANDARD NO. 75

STANDARD NO. 76

STANDARD NO. 77

STANDARD NO. 78

STANDARD NO. 79

STANDARD NO. 80

STANDARD NO. 81

STANDARD NO. 82

STANDARD NO. 83

STANDARD NO. 84

STANDARD NO. 85

STANDARD NO. 86

STANDARD NO. 87

STANDARD NO. 88

STANDARD NO. 89

STANDARD NO. 90

STANDARD NO. 91

STANDARD NO. 92

STANDARD NO. 93

STANDARD NO. 94

STANDARD NO. 95

STANDARD NO. 96

STANDARD NO. 97

STANDARD NO. 98

STANDARD NO. 99

STANDARD NO. 100

29

**X-Ray Investigation of the Crystallization of Vulcanized Rubber on Stretching.** B. V. Lukin and V. I. Kasatochkin. *Rubber Chemistry and Technology*, v. 21, July 1948, p. 621-626. Translated from *Zhurnal Tekhnicheskoi Fiziki*, (Journal of Technical Physics), v. 16, 1946, p. 1383-1388.

Gives results of a detailed investigation of the effect of the amount of crystalline phase in vulcanizates subjected to stretching as a function of the time of vulcanization. A comparison with effect on tensile strength was made for a series of vulcanized stocks of different compositions.

LUKIN, B. V.

"X-RAY Investigation of Vulcanization's Effect on the Molecular Structure and Physicochemical Properties of Natural Rubber." Thesis for degree of Cand. Chemical Sci. Sub 16 May 49, Moscow Inst. of Fine Chemical Technology imeni M. V. Lomonosov.

Summary 82, 18 Dec. 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1949. From Vechernyaya Moskva, Jan-Dec 1949.

LUKIN, B. V.

Radiographic study of the vulcanization process. V. I. Krasnoshchik and B. V. Lukin. *Izvestiya Akad. Nauk S.S.S.R. Ser. Khim. Nauk* 1949, 289-96. —An x-ray study was made of the amorphous phase of rubber and its crystal. by elongation, for various stages of vulcanization. Natural rubber (smoked sheet) gives a pattern which shows a sharp reduction of intensity of the amorphous ring with increase of crystallinity, although the shape of the curve differs from that shown by Hauser and Merk (C.A. 20, 8360). Vulcanized specimens (with S and 2-mercapto-benzothiazole) show a const. intensity of the amorphous ring over a certain range of elongations, with progressive increase of intensity of the crystal. interference. This indicates that the crystal phase arises from that part of the amorphous phase which does not take part in x-ray scattering in the form of the amorphous ring, but rather simulates gaseous scattering. This probably represents parts of chains that are not held together by van der Waal's forces, owing to peculiarities of orientation of chain links. Specimens of the same thickness give different intensities of the amorphous ring: liquid paraffin 0.20, plasticized smoked-sheet rubber 0.24, ordinary smoked-sheet rubber 0.16-0.19, vulcanized rubber 0.12. On elongation of the vulcanized specimens and before the appearance of crystal. interference, the relative intensity of the amorphous ring increases along the line of the diagrammatic equator; this vanishes when the crystal pattern appears; meridional textures appear at this point, but are very weak. Mixts. at low degree of vulcanization show no crystal. on elongation; with increase of vulcanization (7-10% S) the 2nd stage lattice formation through S bridges also suppresses crystal. owing to reduced mobility. Specimens with 7% S show a max. of crystallinity on 400-600% elongation in early stages of vulcanization; in later stages, the crystallinity declines steadily. Heating smoked-sheet rubber in a vulcanization press 1 hr. (especially during the initial period) greatly reduces the ability to form crystal. patterns on elongation. This can be explained by oxidative destruction. However, more prolonged heating again restores the crystal. ability, without change of tensile strength, but with increase of creep. An x-ray study at small incident angles made on vulcanized specimens and at rest and elongated 600% shows a continuous diffuse pattern of the gaseous type; this does not seem to be explainable by the action of the crystal. areas. G. M. Kozlovskii

mens of the same thickness give different intensities of the amorphous ring: liquid paraffin 0.20, plasticized smoked-sheet rubber 0.24, ordinary smoked-sheet rubber 0.16-0.19, vulcanized rubber 0.12. On elongation of the vulcanized specimens and before the appearance of crystal. interference, the relative intensity of the amorphous ring increases along the line of the diagrammatic equator; this vanishes when the crystal pattern appears; meridional textures appear at this point, but are very weak. Mixts. at low degree of vulcanization show no crystal. on elongation; with increase of vulcanization (7-10% S) the 2nd stage lattice formation through S bridges also suppresses crystal. owing to reduced mobility. Specimens with 7% S show a max. of crystallinity on 400-600% elongation in early stages of vulcanization; in later stages, the crystallinity declines steadily. Heating smoked-sheet rubber in a vulcanization press 1 hr. (especially during the initial period) greatly reduces the ability to form crystal. patterns on elongation. This can be explained by oxidative destruction. However, more prolonged heating again restores the crystal. ability, without change of tensile strength, but with increase of creep. An x-ray study at small incident angles made on vulcanized specimens and at rest and elongated 600% shows a continuous diffuse pattern of the gaseous type; this does not seem to be explainable by the action of the crystal. areas. G. M. Kozlovskii

30

P.A.

An x-ray investigation of the crystallization of vulcanized rubber on stretching. II. V. I. Kasatichkin and B. V. Lukin. *Zhur. Tekh. Fiz.* 19, 76-83 (1949); cf. C.A. 41, 5747d. In smoked sheet, without previous plasticization and contg. no fillers, vulcanized at 143° for lengths of time  $\tau$  from 0 to 40 min., and stretched 500%, the fraction  $f$  of the cryst. phase decreases regularly, from 70 to 50%. With increasing  $\tau$  because of destructive oxidation. Within the same limits, the mol. wt. (by viscosity of dil. solns.) falls from 70,000 to below 40,000, and the creep, measured under 1 kg./sq. cm. at 18° in 50 hrs., rises from 150 to 450%. The tensile strength  $\sigma$  falls linearly from 18 to 12 kg./sq. cm. With smoked sheet (100) + S (2), ZnO (5), stearic acid (2), and mercaptobenzothiazole (0.0),  $f$  rises steeply to a max. within the 1st 40 min., then falls off slightly and remains const. with further increasing  $\tau$ . The curve of  $\sigma$  has a similar shape, except that  $\sigma$  falls off slightly with long  $\tau$ . This latter effect is even more pronounced with smoked sheet with the same percentages of S, ZnO, and stearic acid, but with thiuram (0.854) or diphenylguanidine (0.758) instead of mercaptobenzothiazole. In smoked sheet with the latter, but with 7 instead of 2% S, the max.  $f$  is sharper, and its fall with further prolonged  $\tau$  somewhat more marked. The factor responsible for the decrease of  $f$  is evidently the formation of S bridges which reduce the mobility of the mols. and thus counteract crystn.; with a low S content of 2%, the process of spatial network formation is practically completed at the optimum, and has no further effect on more prolonged  $\tau$ . The subsequent fall of both  $f$  and  $\sigma$  is attributed to the plasticizing

action of the oxidation products of rubber. This is borne out by the observed fall of the modulus of elasticity with  $\tau$  prolonged beyond the optimum in mixts. with 2% S. This is not so with 7% S, where prolonged  $\tau$  results in further increasing modulus, owing to continued growth of bridges. Addition of 30% plasticizer lowers  $f$  at all stages of vulcanization; dibutyl phthalate has a stronger  $f$ -lowering effect than mazut. The tensile strength  $\sigma$  is an increasing function of  $f$  over the whole range of vulcanization, but, for a given mixt., each  $f$  is associated with 2 values of  $\sigma$ , one corresponding to the 1st phase, the other to the 2nd phase of the vulcanization (beyond the optimum). This indicates a different nature of the strength in the 2 phases. The amt. of bound S increases with time at the initial stages of the vulcanization, but the material still remains plastic as long as the spatial network has not spread throughout its whole mass. This may account for the fact that a relatively small change in bound S can be accompanied by a relatively large change of  $f$ . Crystn. of vulcanizates in the 2nd phase beyond the optimum, is governed by the d. of the spatial network. More completely crystd. vulcanizates have a greater  $\sigma$ , owing to the greater no. of chains. However, high tensile strength may still be present, even though crystals may have disappeared almost completely; in that case,  $\sigma$  is detd. by oriented chains. Inhibition of crystn. by bound S is due to the noncoincidence of the C-S bond distance and the lattice period of cryst. rubber. Non-bridge S lowers the crystallizability by occupying points which otherwise might have formed part of the crystal.

N. Thon

CA

30

Molecular structure and properties of rubber. V. I. Kasatochkin and B. V. Lukin. *Doklady Akad. Nauk S.S.S.R.* 67, 683-5(1949).—In smoked-sheet rubber, vulcanized NK-1 (smoked sheet 100, ZnO 5, stearic acid 2, S 7, mercaptobenzothiazole 0.3), and vulcanized NK-5 (100, S 2, 2, 0.6), the intensity of the amorphous ring in x-ray diffraction was const. over a wide range of extension, notwithstanding the steady increase in intensity of the spots corresponding to an increase in the amt. of the cryst. phase up to 60%. This constancy of the intensity of the amorphous ring on stretching is interpreted as an indication that the crystals are not formed from the "liquid" part of the amorphous rubber, but from what is termed its "gaseous" part, presumed to consist of free fragments of mol. chains. The considerable change in the d. of rubber on crystn. is in accord with this idea. The "gaseous" part of the amorphous rubber, which should scatter x-rays as a gas, det. the elastic properties of rubber. Comparison of the intensities of the amorphous ring of 3 samples of different elasticities, plasticized and unplasticized smoked sheet, and a highly elastic vulcanizate NK-31 (strength 163 kg./sq. cm., relative elongation 900%, creep under 20 kg./sq. cm. in 50 hrs., 5%), as a function of the thickness (up to 1.0 mm.), showed the highest intensities for low-elasticity and high-plasticity plasticized smoked sheet, lowest intensities for the very highly elastic NK-31, and intermediate values for the unplasticized smoked sheet. N. Thon



Lukin, B.V.

✓ 4119. X-ray investigation of the process of  
vulcanisation of rubber. B. V. LUKIN and V. I.  
KARATOGHIN. "Issledovaniya po Fizike i Khimii  
Kauchuka i Reziny", 1959, p. 74-83. This paper  
appears to embody the same material and con-  
clusions as the paper by the same authors presented  
to the 6th Conference on High-molecular Com-  
pounds, Akad. Nauk SSSR (this journal, 1956, etc.  
1374). 35725

Ref 2

5  
C  
2

DM LHM

Rubber Abs.  
Vol. 31  
Nov. 1953  
Vulcanised  
Natural  
Rubber

4664. X-ray investigation of the crystallisation of vulcanized rubber on stretching. IV. V. I. KASATOCHKIN and B. V. LUKIN. Zhur. Tekh. Fiz., 1950, 20, 1160-6; Chem. Abs., 1953, 47, 1811. Cf. this journal, 1950, 28, 565. The number of crystals was determined as a function of the period of vulcanisation for smoked sheet rubber stretched 400% without and with carbon black as filler, using varying proportions of carbon black, sulphur, stearic acid, zinc oxide, MBT, and thiuram. Without carbon black, crystallisation began to be apparent after 10 min., growing rapidly at first, slowing down, reaching a 60% maximum after 60 min., remaining constant to 220 min., and falling to zero at 300 min. Using 30% carbon black, maximum was reached very soon after the beginning of vulcanisation, fell slightly within 20 min., and then reached a constant value of 60%. This checks with the relationship between the content of rubber crystals and the content of bound sulphur. Carbon black reduced the modulus of elasticity. Without black, tension strength increased but little with the amount of sulphur crystals; with black present, it was small while the sulphur content was small, but became four times as large when the sulphur content reached its optimum. Carbon black also increased the crystallisation of plasticised rubber.

(over)

*Dr. V. I. Krasovskii to E. I. ...*  
The elongation of the X-ray spots indicates that carbon black makes the orientation of the crystals less definite. With carbon black, thiuram makes the rubber crystals more nearly perfect, the explanation of this effect by adsorption of the rubber mol. chains to the carbon particle surface being confirmed by the fact that carbon causes crystallisation of the rubber even in the absence of vulcanising agents, and also by the difference between the crystal orientation and the direction of the mechanical forces in the stretched rubber. The orientation of the mols. in the direction of elongation, coupled with restricted rotation due to adsorption, creates an effect of single-dimensional crystals. Two-dimensional crystals are likely to be formed at the surfaces of adsorption.

63423

*Handwritten signature*

LUKIN, B. V.

PA 187T95

USSR/Physics - X-ray Analysis, Rubber Mar/Apr 51

"The X-ray Analysis of the Molecular Structure of Rubber," V. I. Kasatochkin, B. V. Lukin, Sc. Res Inst of Tire Ind

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 2, pp 209-217

Authors lectured on scattering of X-rays in amorphous caoutchouc, variations in mol structure of caoutchouc under fatigue and wear, crystn of filler vulcanizers of rubber, and mol orientation of filler vulcanizers of synthetic rubber. The following participated in

LC

187T95

USSR/Physics - X-ray Analysis, Rubber Mar/Apr 51  
(Contd)

discussions after the lecture: Z. G. Pinsker, I. Kasatochkin, V. I. Kitaygorodskiy, N. S. Kostetskaya, V. I. Karpov, V. I. Danilov. Lecture read at 3d All-Union Conference on Use of X-rays in Study of Materials held 19 - 24 Jun 50 in Leningrad.

LC

187T95

10771 BY

USSR

X-ray method for the determination of the molecular orientation in noncrystallized resins. B. V. Lukin. *Zhur. Tekh. Fiz.* 21, 663-6(1951).—A method is described for detg. the mol. orientation in noncrystl. resins of butadiene-styrene rubber. This method is based on the relative intensity of the interference lines for the amorphous ring in the direction of the equator. The degree of orientation  $\alpha$  is calcd. by the formula  $\{(a/b) - 1\}100$ , where  $a$  is the intensity of the amorphous ring along the equator and  $b$  is the intensity along the meridian. The change in  $\alpha$  with stretching is also given.

J. Rovtar Leach

BB Jan A

29

B

13267\* X-Ray Study of the Crystallization of Vulcanized Rubber During Stretching. II. V. I. Kasotichkin and B. V. Lukin. *Rubber Chemistry and Technology*, v. 24, July-Sept. 1951, p. 541-549. [Translated from *Zhurnal Tekhnicheskoi Fiziki* (Journal of Technical Physics), v. 19, Jan. 1949, p. 76-83.] Presents a detailed study of the crystallization curves of vulcanization in relation to the elongation of vulcanized mixtures.

ASTM-SLA METALLURGICAL LITERATURE CLASSIFICATION  
3306 CTV-BILVA  
S47285 J

334283 -IP ONY (m)  
A P S E H O S V ZA M T S R QW O M H T M W G ZB D A AND

334283 -IP ONY (m)  
HID U N I XA

CA

Molecular aggregation in amorphous polymers. V. I. Kasatichin and H. V. Lukin. *Doklady Akad. Nauk S.S.S.R.* 77, 81-4 (1981). The previously given (C.A. 64, 22948) interpretation of the structure of amorphous rubber as consisting of a liquid-type part, giving an interference max. of the scattered intensity of x-rays as a function of the scattering angle (due to near-range order), and a disordered gas-type part, is further corroborated by the change of the scattering intensity curves with the temp. With rising temp. (20, 80, 120°), the max. becomes increasingly flatter, and the intensity in the range of small scattering angles increases. The curves are very strongly reminiscent of Noll's (*Phys. Rev.* 42, 386 (1942)) curves for the x-ray scattering intensity of  $R_{12}O$  at different temps., with the max. disappearing completely at 210°. The total scattering intensity  $I = I_g + I_l$ , where the subscripts  $g$  and  $l$  refer to "gaseous" and the "liquid" part, resp. The former is  $I_g = PN_g F^2$ , where  $F$  = structure amplitude of scattering by single links of the mol. chains (dtd. by interference of the radiation coherently scattered by the atoms of the same chain link),  $N_g$  = no. of links constituting the "gaseous" part, and  $P = (1 + \cos^2 \theta)/2$ , where  $\theta$  = scattering angle. The intensity  $I_l$  of the "liquid" part, dtd. by interference of the radiation coherently scattered by links of neighboring chains, as given by Debye's theory of scattering in liquids,

is  $I_l = PN_l F A$ , where  $A = (1 - \int_0^\infty 4\pi r^2 \rho (1 - W) (\sin \pi r / s) dr) / s^2$ , where  $W$  = probability of neighboring disposition of links,  $\rho$  = mean d.,  $s = (4\pi \sin \theta) / \lambda$ , and  $4\pi r^2 \rho dr$  = mass of a spherical shell of thickness  $dr$  at a distance  $r$  from a given link. In the case of complete disorder,  $W = 1$ , and  $I = PN F^2$ , where  $N$  = total no. of links. For high  $\theta$ , the integral tends to zero, and  $I$  tends to the above value for a completely disordered "gaseous" state. For small  $\theta$ , the integral tends to unity,  $I_l = 0$ , and  $I = I_g$ . The coexistence of the "gas" and the "liquid" phases in an amorphous polymer is due to the difficulty of close packing of all links of neighboring mol. chains. The same cause underlies the incomplete crystn. of polymers, as evidenced by x-rays. N. Thon

LUKIN, B. V.

(3)

X-ray investigation of the amorphous state of rubber. V. I. Kasatovich and B. V. Lukin, *Khim. i Fiz. Khim. Vysokomolekul. Soedineniia, Doklady 7-oi Konf. Vysokomolekul. Soedineniia* 1952, 242-5; cf. C.A. 47, 11964c.— The amorphous scattering of rubber is due to 2 types of disorder, one usually found in gases, the other in liquids. Gases show scattering curves which increase strongly towards low angles, while liquids show a diffuse ring which depends on the av. mol. distances. Measurement of the amorphous scattering of rubber as a function of temp. shows a strong increase of the "gaseous" type of scattering with temp. Curves of scattering at 20, 80, and 120° are given and compared with the scattering of diethyl ether (Noll, C.A. 27, 1819). Prolonged treatment of rubber at high temps. (20 hrs. at 100°) causes an increase of 15-20% in "liquid" scattering. This is expected, since strong oxidation takes place and leads to stronger interchain interaction. H. D. Noether



Lokin, B.V.

X-ray methods for studying amorphous polymers. B. V.  
Lokin. *Uchenye Zapiski Leningradskogo Universiteta*.  
Fiz.-mat. Prom. Shernik. (Moscow-Leningrad) Goskhimizdat.  
1955, 43-52; Referat. Zhur., Fiz. 1955, No. 2631. — A dis-  
cussion of x-ray methods in detn. of the mol. order in amor-  
phous polymers, in detn. of mol. orientation in amorphous  
rubbers, and in detn. of the force of the bond between  
the surface of charged particles and rubber. M. K.

SMN

MA  
JES

KASATOCHKIN, V. I.: LUKIN, B. V.

Roentgenographic method of determination of molecular association in amorphous polymers. Izv. AN SSSR Ser. fiz. 17 no. 2:219-223 '53. (MLRA 6:8)

1. Institut goryuchikh iskopayemykh Akademii nauk SSSR.  
(CA 47 no.22:11964 '53) (Polymers and polymerization)

LUKIN, B. V.

Fuel Abst.  
Vol. 15 No. 4  
Apr. 1954  
Natural Solid Fuels:  
Sources and Properties

2737. ELECTRON MICROSCOPIC INVESTIGATION OF THE COMPONENTS OF COAL AND ANTHRACITE. Kasatochkin, V.I., Zolotarevskaya, E.Yu. and Lukin, B.V. (Izv. Akad. Nauk SSSR, Ser. Fiz. (Bull. Acad. Sci. U.S.S.R., Ser. Phys.), 1953, vol. 17, 246-248; abstr. in Chem. Abstr., 1953, vol. 47, 10941). In electron micrographs of anthracite, vitrain, fusain, humic acids, and coal black the bands with hkl indexes corresponding to "tilted" atomic planes of the graphite crystal lattice are absent. This indicates the absence of a three-dimensional order of carbon atoms and an amorphous character. Vitrain and anthracite are structurally anisotropic, whereas fusain, humic acid, and blacks are isotropic. Anthracite contains both vitrain and fusain. C.A.

(3) fuel

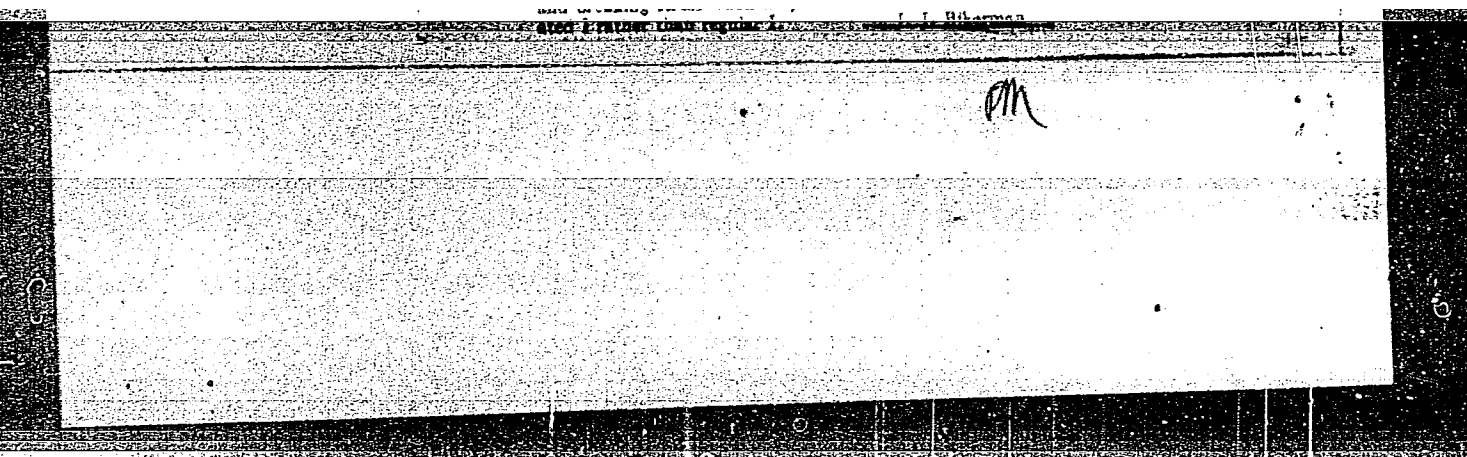
Lukin, B. V.

*Maths* ✓ Theory of reinforcement of rubber: reaction of carbon black with sulfur and rubber. B. A. Degadkin, B. Lukin, Z. Tarasova, Z. Skorodumova, and I. Tutorskii (Sci. Res. search Inst. Tire Ind., Moscow). *Kolloid. Zh.* 18, 418-19 (1956).—Channel black (I) heated with S (labeled with  $S^{35}$ ) in toluene for 10 hrs. combined chemically with 0.04% and 0.28% S at 110° and 150°, resp.; the uptake of S was greater when an accelerator (a condensation product of AcH and PrCOH with  $PHNH_2$ ) was also present and greatest when I was heated with H before heating with S. This hydrogenation lowered the O content of I from 4.4 to 2.1%. The aggregates of hydrogenated I were larger by about 20% than those of the original I. The percentage of Na butadiene:

*2 May*

"APPROVED FOR RELEASE: 07/12/2001

CIA-RDP86-00513R001030810008-0



APPROVED FOR RELEASE: 07/12/2001

CIA-RDP86-00513R001030810008-0"

LUKIN, B.

Theory of reinforcement of rubber: reaction of carbon  
black with sulfur and rubber. B. A. Dogadkin, B. Lukin,  
Z. Tarasova, Z. M. Skarodumova, and I. Puforsvill. Col-  
loid J. (U.S.S.R.) 43, 407-12 (1965) (English translation). —  
See C.A.B. 51, 16305.

LUKIN, B.V.

AUTHORS: Lukin, B.V., Nagornyy, V.G.

32-12-27/71

TITLE: A Method for the Determination of the Closed Porosity and of Structural Defects (Metod opredeleniya zamknutoy poristosti i defektnosti struktury).

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 12, pp. 1458-1461 (USSR)

ABSTRACT: The present paper describes various kinds of structural defects and closed porosity, which are able to exercise considerable influence on the characteristics of metals. By closed porosity such a porosity is meant here as can be determined individually in a sample, in contrast to such as is usual in a material and is not taken into account in normal density numbers, although it often occupies up to 10% of the total volume. The here suggested new method is based upon a comparison of the results of two kinds of determining the specific weight of the samples: radiographical and pyknometrical methods of determination. For the first case, a number of suggestions is made in order to make the method more perfect, as e.g. in order to obtain sharper radiogram lines it is suggested that the thinnest possible samples be used, and in the other case it is recommended to apply small quantities of the sample on to a glass- or quartz thread, so

Card 1/2

A Method for the Determination of the Closed  
Porosity and of Structural Defects

32-12-27/71

that in the radiodiagram doubled lines of about 0.15 mm are obtained. The second method of determination consists in measuring the diameter of the rings (OO 1) for the determination of the average periods according to the gravitational centers of mass of the cusps on the microphotograms (according to R.E. Franklin, Ref. 1). As decisive characteristic of the structural defects and closed porosity of the sample the divergence (D) of the results obtained by determining the specific weight according to both of the mentioned methods was considered, which is expressed by the following formula:

$$D = \frac{d_1 - d_2}{d_1} \cdot 100\%.$$

Results are shown in form of a diagram and a

table. There are 2 figures, 2 tables, and 1 non-Slavic reference.

ASSOCIATION: Institute for Combustible Minerals AS USSR (Institut  
goryuchikh iskopayemykh Akademii nauk SSSR).

AVAILABLE: Library of Congress

Card 2/2 1. Metals-Characteristics



5(4)

SOV/20-122-2-27/42

AUTHORS: Tikhomirova, N. N., Lukin, E. V., Razumova, L. L.,  
Voyevodskiy, V. V., Corresponding Member, Academy of Sciences,  
USSR

TITLE: Using Electron Paramagnetic Resonance and Roentgenography in  
Studying the Structure of the Carbonization Products Obtained  
From Carbon-Containing Substances  
(Issledovaniye stroyeniya produktov karbonizatsii  
uglerodsoderzhashchikh veshchestv metodom elektronnoy para-  
magnitnoy rezonans i rentgenografiyey)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 2, pp 264-266  
(USSR)

ABSTRACT: The method of paramagnetic electron resonance permits im-  
mediate detection of free radicals in the investigated system  
and a measurement of their concentration. In order to find  
the possibilities which are given by the investigation of  
the structure of carbonized substances by the  
method of paramagnetic electron resonance (and simultaneous-  
ly by radiography), the authors investigated the structural  
variations caused by the carbonization of polyvinyl chloride

Card 1/3

SOV/20-122-2-27/42

Using Electron Paramagnetic Resonance and Roentgenography in Studying the Structure of the Carbonization Products Obtained From Carbon-Containing Substances

and polyvinylidenechloride. The carbonization was carried out in an inert atmosphere in the temperature interval of 350-700°C. The signal of the electron paramagnetic resonance (which indicates the existence of free radicals) appears in the first stages of the carbonization of polyvinyl chloride and polyvinylidenechloride (beginning with 350°). A diagram shows the variation of the signal width for the 2 investigated substances as a function of the carbonization temperature. A relatively wide line (7 Gauss) in polyvinyl chloride is an argument in favor of an essential influence of the hyperfine splitting up on hydrogen nuclei. Such great widths are characteristic of some natural coals. In the case of polyvinylidenechloride (especially in the initial stages of carbonization) the line of paramagnetic electron resonance is by far narrower than that of the product of the carbonization of polyvinyl chloride. According to radiographic data, an increase of the calcination temperature to 450° only slightly changes the character of the products of the carbonization of polyvinyl chloride. Other results are then discussed.

Card 2/3

SOV/20-122-2-27/42

Using Electron Paramagnetic Resonance and Roentgenography in Studying the  
Structure of the Carbonization Products Obtained From Carbon-Containing  
Substances

According to these results, the appearing of a wide signal  
is connected with the existence of free valences near the  
individual carbon nets or blocks in which conduction elec-  
trons appear. There are 2 figures.

SUBMITTED: June 28, 1958

Card 3/3

LUKIN, B.V.; CHERNIKOV, A.M.

Project of a Soviet academic expedition to South America; remarks  
on the history of Soviet - Latin American scientific ties. Vest.  
AN SSSR 33 no.7:101-103 J1 '63. (MIRA 16:8)  
(Scientific expeditions)

KOMISSAROV, B.N. (Leningrad); LUKIN, B.V., (Leningrad)

Russian scientists in South America. Priroda 54 no.1:105-107  
Ja '65. (MIRA 18:2)

LUKIN, B.V.; NAGORNYY, V.G.

Structure of calcined and graphitized cokes and their reactivity.  
Konstr. uglegraf. mat. no.1:170-174 '64.

(MIRA 17:11)

L 24674-65 EWP(s)/EPA(s)-2/ENT(m)/EPF(c)/FCS/ENG(v)/EPR/EWP(j)/T/EWP(b)/EWA(1)  
 PC-4/PS-5/PI-4/PR-4/PS-4/PT-10 RM/WW

ACCESSION NR: AF5004687

S/0191/64/000/009/0013/0017

AUTHOR: Severov, A. A.; Gorbacheva, T. B.; Lukin, B. V.; Sergiyev, V. K.

TITLE: Changes in the fine and porous structures of phenol-formaldehyde resin during rapid short-duration heating to high temperatures

SOURCE: Plasticheskiye massy, no. 9, 1964, 13-17

TOPIC TAGS: phenolic plastic, polymerization, heat effect, crystal chemistry, polymer structure

Abstract: Changes in the structure of GOST 4559-49 phenol-formaldehyde resin have been studied during rapid short-duration heating up to 2900° C. The initial resin was cured for about 20 days at 160° C; its degree of polymerization was 98.2%. The specimens were heated at rates of 10,000—20,000° C/min. Heating was conducted in increments of 100° below 1100° C and 300° above 1100° C, with a 1-min holding time at each temperature. The samples were then cooled in nitrogen. Changes in the porous structure of the specimens were studied by visual observation, micrographs, and porosity measurements based on moisture absorption. In addition, weight loss, shrinkage, and compressive

Card 1/6

L 24674-65

ACCESSION NR: AP5004687

strength of the specimens were determined. The results of the study are given in the form of micrographs and plots of porosity and weight versus temperature (see Fig. 1) and shrinkage and strength versus temperature (see Fig. 2).

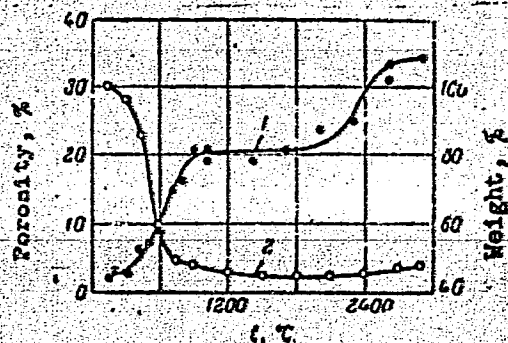


Fig. 1. Dependence of porosity (1) and weight (2) of phenol-formaldehyde resin on heating temperature

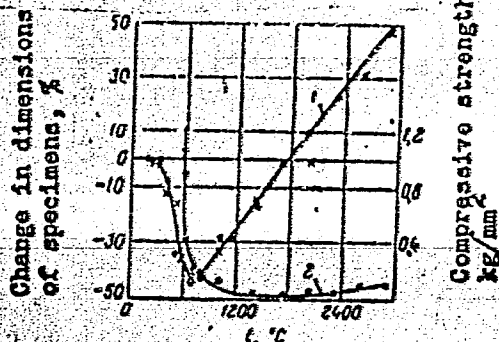


Fig. 2. Dependence of shrinkage (1) and strength (2) of specimens of phenol-formaldehyde resin on the heating temperature

Card 2/6



L 24674-65

ACCESSION NR: AP5004687

The results showed that: 1) Pores and cracks develop rapidly at 400—700° C as a result of the evolution of volatile pyrolysis products. The process causes considerable weight loss and shrinkage of specimens. 2) The pores continue to develop at 700—1300° C, but at a slower rate. At the same time wide cracks are formed. These cracks cannot be determined by moisture absorption, and the magnitude of the measured porosity remains unchanged up to 1900° C. 3) At 1900—2600° C, the pores continue to develop; since specimen weight remains unchanged, it is concluded that the porosity develops as a result of an increase in the density of the coke pore walls. 4) At 2600—2900° C, the pores become filled with secondary products formed by pyrolysis-product decomposition. The specimens become blocks and acquire a metallic luster, and their weight increases slightly. 5) The specimen volume increases continuously at above 700° C and attains 150% of its initial value at 2900° C. 6) The specimen compressive strength drops from its initial value of 700—2100 kg/mm<sup>2</sup> to 0.05 kg/mm<sup>2</sup> at 1700—2600° C, and then increases again at 2900° C to 0.10 kg/mm<sup>2</sup> owing to the deposition of secondary products which fill the pores and cracks.

Card 3/6

L 24674-65

ACCESSION NR: AP5004687

The fine structure of the resin was studied by the x-ray diffraction method. The results of the study are given in the form of x-ray diffraction patterns and in the form of changes of the diffusion ring width and of interplanar spacings in the c-axis direction with temperature (see Fig. 3).

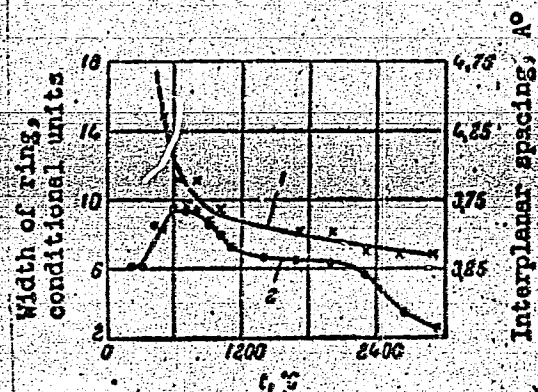


Fig. 3. Dependence of interplanar spacing and width of diffusion ring on temperature:

1) Intermolecular distance and interplanar spacing; 2) width of the diffusion ring.

Card 4/6

L 24674-65

ACCESSION NR: AP5004687

These results show that: 1) Heating of the resin to 250° C causes its further polymerization. 2) At 300—700° C, the resin degrades and coke structures are formed. 3) Above 800° C, the formation of primary and the ordering of secondary coke structures (bundles) continues; the two-dimensional coke-structure formation ends at 1200—1300° C. 4) At 1200—2300° C, slow growth of bundles continues. 5) At higher temperatures, in the pregraphitization period, the bundles begin to grow more rapidly; regions with a three-dimensional ordering (crystallites of graphite) appear at 2900° C. Thus during rapid heating graphitization begins at higher temperatures than during heating at a rate of 10° C/min with 2-hr holding periods, in which case graphitization begins at 2400° C.

COMMENT: The article is interesting as an apparent attempt to determine the character and possibly the rate of progressive thermal deterioration of a GRP binder at temperatures and heating rates comparable to those arising in missile combustion chambers or on the surface of re-entry plates. At the given heating rate, i.e., 170-330 °C/sec, testing temperatures of 400-2900°C could be reached within the time required to reproduce approximately the thermal conditions to which GRP used for aerospace purposes is subjected. It is true that only the binder and not the GRP itself was tested, and that heat transfer was not

Card 5/6

L 24674-65

ACCESSION NR: AP5004687

studied in this series of experiments. However, a knowledge of the character of the degradation of the least resistant component is essential for further research. The low compressive-strength values obtained for the coke specimens may be of importance in evaluating the crumbling of coked material which serves as a shield for the plastic which is still intact.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MT, TD

NO REF SOV: 003

OTHER: 002

FSB v.1, no.1

Card 6/6

L 31335-65 EWG(j)/EMP(e)/EPA(s)-2/ENT(m)/EPF(e)/EPF(n)-C/EWG(m)/EPR/T/EMP(t)/EPA(bb)-2  
EMP(b) Fe-l/Ps-l/Pt-10/Pu-l IJP(c) RGH/JE/WW/JG/AT/SH  
ACCESSION NR: AP5006481 S/0294/65/003/001/0169/017081  
66  
E

AUTHOR: Lukin, B. V.; Tarabanov, A. S.

TITLE: First all-union scientific and technical conference on silicon carbide

SOURCE: Teplofizika vysokikh temperatur, v. 3, no. 1, 1965, 169-170

TOPIC TAGS: metallurgic conference, silicon compound, carbide, crystal, high  
temperature metal, refractory 27 27

ABSTRACT: The First All-Union Scientific and Technical Conference on Silicon  
Carbide was held 27-30 October 1964 at the Institute of Materials Science  
of the Russian Academy of Sciences. About 180 people representing

Various organizations attended the presentation of the structure, properties, and applications of silicon carbide.

L. N. Frantsevich, V. V. Pasynkov, I. V. Ryzhikov, and others treated general problems. In the subsequent discussion, the demand for new silicon carbide-base construction materials and high-purity silicon carbide crystals was revealed. It was pointed out that the demand for silicon carbide materials considerably exceeds their production in the SSSR.

Card 1/4

L 31335-65  
ACCESSION NR: AP5006481

I. N. Frantsovich, G. G. Gnesin, and others discussed high-temperature properties and applications of silicon carbide. The thermal and physical properties of the best material, which was produced by reactive sintering of 85% SiC with 15% petroleum coke, were determined. Heating elements made of the material withstood 1580--1600° C for 450--500 hr in air and resisted molten Cu, Zn, and Si.

T. Ya. Kosolapova and G. A. Yasinskaya examined the refractory and chemical properties of silicon carbide. They established that silicon carbide readily reacted with oxygen (air), water vapor, and MgO at 1700° C. Temperatures of the initial reaction were 1000° C with MgO, 1300° C with Cr<sub>2</sub>O<sub>3</sub>, 1400° C with ZrO<sub>2</sub>, 1500° C with corundum, and 1700° C with BeO. Niobium and molybdenum form NbSi<sub>2</sub> and MoSi<sub>2</sub> at 1300° C. Bismuth and sodium react with SiC at 1000° C and 900° C, respectively. Silicon carbide is not wetted by molten Zn, Pb, or Cd. Refractory SiC-Si-Si<sub>3</sub>N<sub>4</sub> material was used for making thermocouple wells for 100 hr service at 1000° C max.

Card 2/4

L-31335-65

ACCESSION NR: AP5006481

P. S. Kislyy introduced a thermoelectrode of SiC-base material, which, coupled with graphite, could be used for measuring temperatures up to 1500—1600° C in neutral or oxidizing media. Its service life was 100 hr at 1350° C.

The physicochemical properties of SiC and the production technology of refractories with a silicon carbide base were discussed by the delegates of the All-Union Scientific Research Institute of Refractories (Leningrad). Corrosion resistance of a 95% SiC material was determined in vacuum, nitrogen, and argon at 1600—2000° C.

A group of papers was devoted to silicon carbide single crystals and crystallization of silicon carbide. Chemical, spectroscopic, and radio-activation methods for analyzing SiC crystals were outlined.

Investigations of the Si-C-B system and SiC-B<sub>4</sub>C high-temperature materials were the topics of another group of papers.

Card 3/4



L 31335-65

ACCESSION NR: AP5006481

Experimental data on the stability of materials with silicon carbide base in pilot-plant service and problems of production were presented in several papers.

The proceedings of the Conference are to be published in 1965.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: IG, MT

NO REF SOV: 000

OTHER: 000

ATD PRESS: 3198-F

Card 4/4

SEVEROV, A.A.; GORBACHEVA, T.B.; LUKIN, B.V.; SERGEYEV, V.K.

Changes of the thin and porous structures of phenol-formaldehyde  
resins at high-speed, short-term high-temperature heating. Plast.  
massy no.9:13-17 '64. (MIRA 17:10)

LUKIN, B.V.; TARABANOV, A.S.

First All-Union Scientific Conference on the Technology of Silicon  
Carbide. Teplofiz. vys. temp. 3 no.1:169-170 Ja-F '65.  
(MIRA 18:4)

DUKIN, B.V.

On the history of Russian explorations in Latin America; the  
50th anniversary of the 1914-1915 expedition. Izv. Vses. geog.  
ob-va 97 no.1:70-75 Ja-F '65.

(MIRA 18:3)

LUKIN, D., gvardii podpolkovnik

Military work in the name of our motherland. Voen.vest. 43 no.11:  
46-54 N '63. (MIRA 16:12)

LUKIN, D. A.

SUKONSHCHIKOVA, A. A.; LUKIN, D. A.

Indirect roentgenotherapy of unveal tuberculosis. Vest. oft.,  
Moskva 31 no. 4:19-23 July-Aug. 1952. (CLML 22:5)

1. Candidates Medical Sciences. 2. Of Leningrad Scientific-Research  
Institute for Eye Diseases imeni L. L. Girshman.

LUKIN, D.A., starshiy nauchnyy sotrudnik kandidat meditsinskikh nauk.

Teleroentgenotherapy of skin diseases. Vest.ven.i derm. no.5:17-20  
S-0 '53. (MLRA 6:12)

1. Iz Voenno-meditsinskoy akademii im. S.M.Kirova.  
(Radiotherapy) (Skin--Diseases)

LUKIN, D.A.; MURATKHODZHAYEV, N.K.; SAVINA, A.A.

Treatment of chronic eczemas and neurodermatitis with  $Sr^{90}$ .  
Med. rad. 5 no-11:7-11 N '60. (MIRA 13:12)  
(STRONTIUM—ISOTOPES) (ECZEMA)  
(SKIN—DISEASES—PSYCHOSOMATIC ASPECTS)



L 22871-66 EWT(d)/FSS-2/EWT(1)/EEC(k)-2/FCC/EWA(d)/EWA(h) AST/TT/RB/QW/WS-2  
ACC NR: AP6012828 SOURCE CODE: UR/0293/66/004/002/0238/0241

AUTHOR: Kazantsev, A. N.; Lukin, D. S.

ORG: none

TITLE: Field intensity of short radio waves emitted by an artificial earth satellite

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 2, 1966, 238-241

TOPIC TAGS: radio communication, satellite communication, radio wave propagation

ABSTRACT: A study is made of the dependence of the field intensity of short radio waves emitted by an artificial earth satellite on distance under various propagation conditions and parameters of the ionosphere. Formulas are derived for calculating the focusing factor for the emission (without consideration of the magnetic field) and for the total absorption coefficient factor for the radio beam path. The Strela-M computer was used for the calculations. Some results are shown in the figure. The curves show the upper and lower

Card 1/2

UDC: 621.371

L 22871-66

ACC NR: AP6012828

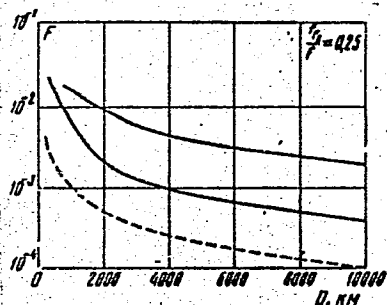


Fig. 1. Dependence of field intensity on distance

—— Focusing factor taken into account  
 ---- According to  $1/D$ .

limits of the field intensity for various angles of the beam output. For the case of reflection from the ionosphere only, the field intensity decreases slower than  $1/D$ . Orig. art. has: 3 figures and 12 formulas.

[GS]

SUB CODE: 17/ SUBM DATE: 23Jul65/ ORIG REF: 004/ ATD PRESS: 4234

Card 2/2 LC

L 24831-66 EWT(d)/FSS-2/EWT(1)/EWT(m)/EWP(w)/EEC(k)-2/FCC/EWP(v)/T-2/EWP(k)/

ACC NR: AP6012827

EWA(h)/ETC(m)-6 IJP(c) SOURCE CODE: UR/0293/66/004/002/0221/0237

AUTHOR: Kazantsev, A. N.; Lukin, D. S. AST/EM/GW

80

B

ORG: none

TITLE: Mechanism of the radio-wave propagation from artificial earth satellites

4

26

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 2, 1966, 221-237

TOPIC TAGS: radio wave propagation, magnetic field, ionosphere, artificial satellite

ABSTRACT: The mechanism of radio-wave propagation from artificial earth satellites has been investigated (without taking into consideration the magnetic field and collisions), based on the calculation of the radio-wave trajectory in a heterogeneous ionosphere, a hose electron concentration arbitrarily changes according to two coordinates. Calculations are made of ray trajectories in a spherical layered ionosphere in the absence and in the presence of a horizontal gradient. It was shown that in the case of a spherical layered ionosphere, there are two mechanisms of radio-wave propagation, namely, consecutive reflections from the ionosphere and from the earth's surface and consecutive reflections from the ionosphere only. The presence of the horizontal gradient of the electron concentration substantially affects the wave propagation (ionosphere -- ionosphere) and leads to the arrival of radiation on the earth from artificial earth satellites at distances of 4,000 to 6,000 km.

Card 1/2

UDC: 621.371

L 24831-66

ACC NR: AP6012827

The time of the signal propagation is compared with the experimental data according to the round-the-world echo. Orig. art. has: 14 figures and 28 formulas. [HP]

SUB CODE: 03/ SUBM DATE: 23Jul65/ ORIG REF: 005/ OTH REF: 001/

Card 2/2 dda

ACCESSION NR: AP4006839

S/0120/63/000/006/0173/0174

AUTHOR: Lukin, E. A.; Shitikov, B. I.

TITLE: Transistorized broadband pulse generator

SOURCE: Pribery\* i tekhnika eksperimenta, no. 6, 1963, 173-174

TOPIC TAGS: broadband pulse generator, transistorized pulse generator, pulse generator, low-impedance pulse generator, digital computer, testing, pulse oscillator

ABSTRACT: A pulse generator is described which consists of a master multi-vibrator, a starting-pulse shaper, an output-pulse shaper (one-shot multi-vibrator), an amplifier, an amplifier-phase-inverter, and an emitter-type output repeater. The master multivibrator can operate in any of the ten bands: 3, 2, 1 mc, 500, 250, 100, 50, 20, 1 kc, and 20 cps. The shaped-pulse duration is 0.1 microsec. The output-pulse shaper produces pulses of from 0.2 microsec to

Card 1/2

ACCESSION NR: AP4006839

10 millisec. The output impedance is 5 ohms; output pulse power, 18 w; the output-pulse amplitude can be varied gradually from 0 to  $\pm 18$  v. The instrument is intended for aligning digital computers and other pulsed devices. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 11Jan63

DATE ACQ: 24Jan64

ENCL: 00

SUB CODE: SD

NO REF SOV: 001

OTHER: 000

Cord 2/2

L 1949-66 FBD/EWT(1) GW/WS-2

ACCESSION NR: AP5020672

UR/0033/65/042/004/0705/0708  
523.164.42

44  
34  
B

AUTHOR: Lastochkin, V. P.; Lukin, E. B.; Stankevich, K. S.; Tseytlin, N. M.  
55 55 55 55

TITLE: Using lunar occultations to study the Crab Nebula

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 4, 1965, 705-708

TOPIC TAGS: radio astronomy, nebula, lunar phenomenon

ABSTRACT: During lunar occultation of a discrete source, the radio waves emitted by the source are diffracted by the surface of the moon, and an observer on the earth sees a distribution of intensities which corresponds to the Fresnel diffraction region. An occultation can be considered as a diffraction on the edge of an infinite half-screen. The width of the interference bands generated by superposition of the direct rays and those reflected from the spherical lunar surface, in a plane perpendicular to the incident rays and passing through the center of the moon, being

$$\delta = \frac{3}{2} a \left( \frac{\lambda}{4a} \right)^{1/2}$$

(where  $a$  is the radius of the moon), is smaller by a factor of  $10^2-10^3$  than

Card 1/4

L 1940-66

ACCESSION NR: AP5020672

the first Fresnel zone  $\sqrt{\lambda R}$  ( $R$  is the distance to the moon), and consequently the average distribution of the field cannot be altered by possible interference effects. Experimental data on the distribution of intensity during occultations of a source with extremely small angular dimensions agree well with the diffraction pattern of an infinite half-screen. Ordinarily, the antenna is directed toward the discrete source during observation of an occultation, so that the moon is a moving screen. If temperature changes in the antenna due to passage of the moon through the radiation pattern during occultation of the source are disregarded, then the antenna temperature is proportional to:

$$T_A \sim \int \int F(\theta, \phi) T(\theta, \phi) I(\theta - x, \phi) d\theta d\phi,$$

where the  $\theta$  axis is along the direction of motion of the source,  $F(\theta, \phi)$  is the antenna pattern,  $T(\theta, \phi)$  is the distribution of brightness from the source, and  $I(\theta - x, \phi)$  is the distribution of intensity from a point source for the case of diffraction on the edge of an infinite half-screen.

$$I(\theta - x) = \left\{ C \left[ (\theta - x) \sqrt{\frac{\pi R}{\lambda}} \right] + \frac{1}{2} \right\}^2 + \left\{ S \left[ (\theta - x) \sqrt{\frac{\pi R}{\lambda}} \right] + \frac{1}{2} \right\}^2$$

Card 2/4



L 1940-66

ACCESSION NR: AP5020672

and

$$C(w) = \sqrt{\frac{2}{\pi}} \int_0^w \cos \eta^2 d\eta \quad \text{and} \quad S(w) = \sqrt{\frac{2}{\pi}} \int_0^w \sin \eta^2 d\eta$$

10

are Fresnel integrals. It is shown that diffraction effects should be taken into account in the reduction of occultation curves even when the source is extended. Three occultations of the Crab Nebula by the moon were observed at 535, 180, and 422 Mc. These occultations were used to obtain data on the angular dimensions of the nebula and on the shift of the effective emission center. The position of the emission center for the nebula is given in Table 1 of the Enclosure, where  $\alpha$  and  $\delta$  are given for points of the source located on the intersection of the source direction of motion with the edge of the lunar disk. "The authors are sincerely grateful to A. G. Kuntsevich and V. S. Lazarevskiy for making the astronomical calculations, and to O. N. Shipulev and G. N. Nikulin for help in making the measurements." Orig. art. has: 4 figures, 6 formulas, 1 table. [14]

ASSOCIATION: Radiofizicheskiy institut Gor'kovskogo gos. universiteta (Radio-physics Institute, Gorky State University)

55

SUBMITTED: 22Dec64

ENCL: 01

SUB CODE: AA

NO REF SOV: 002

OTHER: 005

ATD PRESS: 4/15

Card 3/4

L-1940-66

ACCESSION NR: AP5020672

ENCLOSURE: 01

Table 1.

Frequency, Mc	Transit time of the edge of the moon through the center of the source	$\alpha$ (1950)	$\Delta\alpha$	$\delta$ (1950)	Angular diameter	Positional occultation angle
535	18 <sup>h</sup> 59 <sup>m</sup> 9	5 <sup>h</sup> 31 <sup>m</sup> 30 <sup>s</sup> 9	$\pm 0.2^s$	21°59'4	5.5'	74°
535	20 <sup>h</sup> 07 <sup>m</sup> 3	5 <sup>h</sup> 31 <sup>m</sup> 20 <sup>s</sup> 3	$\pm 0.2^s$	21°59'3	5.5'	278°
180	14 <sup>h</sup> 03 <sup>m</sup> 5	5 <sup>h</sup> 31 <sup>m</sup> 31 <sup>s</sup> 4	$\pm 0.4^s$	21°59'4	5.5'	108°
180	15 <sup>h</sup> 07 <sup>m</sup> 0	5 <sup>h</sup> 31 <sup>m</sup> 29 <sup>s</sup> 6	$\pm 0.45^s$	21°59'3	6'	236°
412	-	-	-	-	6'	127°

Card 4/4

LUKIN, F.F.

Animal husbandry specialist with broad training. Zhivotnovodstvo  
20 no.9:84 S '58. (MIEA 11:10)

1. Zamestitel' direktora po uchebnoy chasti Novochoerkasskogo zoo-  
vettekhnika.

(Stock and stockbreeding--Study and teaching)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 AND 101H (PAGES)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

SA

364

048.319.6.0267.0 - 64

Pulse transformer. LUKIN, F. V. *Radiotekhnika*, 2 (No. 4) 46-61 (1947) In Russian.—An analysis of design is given. Several nomograms are constructed plotting pulse amplitude against the relevant time constants with parameter  $\beta$ , a function of primary source impedance, leakage inductance and output shunt capacitance. A numerical example is treated in detail: given input and output matching data, information on the applied pulse, dimensions and properties of laminations to be used; the number of turns, winding space, magnetizing power and losses are determined. A. I.

COMMON ELEMENT

COMMON VARIABLE

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

130M 131M 132M 133M 134M 135M 136M 137M 138M 139M 140M 141M 142M 143M 144M 145M 146M 147M 148M 149M 150M 151M 152M 153M 154M 155M 156M 157M 158M 159M 160M 161M 162M 163M 164M 165M 166M 167M 168M 169M 170M 171M 172M 173M 174M 175M 176M 177M 178M 179M 180M 181M 182M 183M 184M 185M 186M 187M 188M 189M 190M 191M 192M 193M 194M 195M 196M 197M 198M 199M 200M 201M 202M 203M 204M 205M 206M 207M 208M 209M 210M 211M 212M 213M 214M 215M 216M 217M 218M 219M 220M 221M 222M 223M 224M 225M 226M 227M 228M 229M 230M 231M 232M 233M 234M 235M 236M 237M 238M 239M 240M 241M 242M 243M 244M 245M 246M 247M 248M 249M 250M 251M 252M 253M 254M 255M 256M 257M 258M 259M 260M 261M 262M 263M 264M 265M 266M 267M 268M 269M 270M 271M 272M 273M 274M 275M 276M 277M 278M 279M 280M 281M 282M 283M 284M 285M 286M 287M 288M 289M 290M 291M 292M 293M 294M 295M 296M 297M 298M 299M 300M 301M 302M 303M 304M 305M 306M 307M 308M 309M 310M 311M 312M 313M 314M 315M 316M 317M 318M 319M 320M 321M 322M 323M 324M 325M 326M 327M 328M 329M 330M 331M 332M 333M 334M 335M 336M 337M 338M 339M 340M 341M 342M 343M 344M 345M 346M 347M 348M 349M 350M 351M 352M 353M 354M 355M 356M 357M 358M 359M 360M 361M 362M 363M 364M 365M 366M 367M 368M 369M 370M 371M 372M 373M 374M 375M 376M 377M 378M 379M 380M 381M 382M 383M 384M 385M 386M 387M 388M 389M 390M 391M 392M 393M 394M 395M 396M 397M 398M 399M 400M 401M 402M 403M 404M 405M 406M 407M 408M 409M 410M 411M 412M 413M 414M 415M 416M 417M 418M 419M 420M 421M 422M 423M 424M 425M 426M 427M 428M 429M 430M 431M 432M 433M 434M 435M 436M 437M 438M 439M 440M 441M 442M 443M 444M 445M 446M 447M 448M 449M 450M 451M 452M 453M 454M 455M 456M 457M 458M 459M 460M 461M 462M 463M 464M 465M 466M 467M 468M 469M 470M 471M 472M 473M 474M 475M 476M 477M 478M 479M 480M 481M 482M 483M 484M 485M 486M 487M 488M 489M 490M 491M 492M 493M 494M 495M 496M 497M 498M 499M 500M 501M 502M 503M 504M 505M 506M 507M 508M 509M 510M 511M 512M 513M 514M 515M 516M 517M 518M 519M 520M 521M 522M 523M 524M 525M 526M 527M 528M 529M 530M 531M 532M 533M 534M 535M 536M 537M 538M 539M 540M 541M 542M 543M 544M 545M 546M 547M 548M 549M 550M 551M 552M 553M 554M 555M 556M 557M 558M 559M 560M 561M 562M 563M 564M 565M 566M 567M 568M 569M 570M 571M 572M 573M 574M 575M 576M 577M 578M 579M 580M 581M 582M 583M 584M 585M 586M 587M 588M 589M 590M 591M 592M 593M 594M 595M 596M 597M 598M 599M 600M 601M 602M 603M 604M 605M 606M 607M 608M 609M 610M 611M 612M 613M 614M 615M 616M 617M 618M 619M 620M 621M 622M 623M 624M 625M 626M 627M 628M 629M 630M 631M 632M 633M 634M 635M 636M 637M 638M 639M 640M 641M 642M 643M 644M 645M 646M 647M 648M 649M 650M 651M 652M 653M 654M 655M 656M 657M 658M 659M 660M 661M 662M 663M 664M 665M 666M 667M 668M 669M 670M 671M 672M 673M 674M 675M 676M 677M 678M 679M 680M 681M 682M 683M 684M 685M 686M 687M 688M 689M 690M 691M 692M 693M 694M 695M 696M 697M 698M 699M 700M 701M 702M 703M 704M 705M 706M 707M 708M 709M 710M 711M 712M 713M 714M 715M 716M 717M 718M 719M 720M 721M 722M 723M 724M 725M 726M 727M 728M 729M 730M 731M 732M 733M 734M 735M 736M 737M 738M 739M 740M 741M 742M 743M 744M 745M 746M 747M 748M 749M 750M 751M 752M 753M 754M 755M 756M 757M 758M 759M 760M 761M 762M 763M 764M 765M 766M 767M 768M 769M 770M 771M 772M 773M 774M 775M 776M 777M 778M 779M 780M 781M 782M 783M 784M 785M 786M 787M 788M 789M 790M 791M 792M 793M 794M 795M 796M 797M 798M 799M 800M 801M 802M 803M 804M 805M 806M 807M 808M 809M 810M 811M 812M 813M 814M 815M 816M 817M 818M 819M 820M 821M 822M 823M 824M 825M 826M 827M 828M 829M 830M 831M 832M 833M 834M 835M 836M 837M 838M 839M 840M 841M 842M 843M 844M 845M 846M 847M 848M 849M 850M 851M 852M 853M 854M 855M 856M 857M 858M 859M 860M 861M 862M 863M 864M 865M 866M 867M 868M 869M 870M 871M 872M 873M 874M 875M 876M 877M 878M 879M 880M 881M 882M 883M 884M 885M 886M 887M 888M 889M 890M 891M 892M 893M 894M 895M 896M 897M 898M 899M 900M 901M 902M 903M 904M 905M 906M 907M 908M 909M 910M 911M 912M 913M 914M 915M 916M 917M 918M 919M 920M 921M 922M 923M 924M 925M 926M 927M 928M 929M 930M 931M 932M 933M 934M 935M 936M 937M 938M 939M 940M 941M 942M 943M 944M 945M 946M 947M 948M 949M 950M 951M 952M 953M 954M 955M 956M 957M 958M 959M 960M 961M 962M 963M 964M 965M 966M 967M 968M 969M 970M 971M 972M 973M 974M 975M 976M 977M 978M 979M 980M 981M 982M 983M 984M 985M 986M 987M 988M 989M 990M 991M 992M 993M 994M 995M 996M 997M 998M 999M 1000M 1001M 1002M 1003M 1004M 1005M 1006M 1007M 1008M 1009M 1010M 1011M 1012M 1013M 1014M 1015M 1016M 1017M 1018M 1019M 1020M 1021M 1022M 1023M 1024M 1025M 1026M 1027M 1028M 1029M 1030M 1031M 1032M 1033M 1034M 1035M 1036M 1037M 1038M 1039M 1040M 1041M 1042M 1043M 1044M 1045M 1046M 1047M 1048M 1049M 1050M 1051M 1052M 1053M 1054M 1055M 1056M 1057M 1058M 1059M 1060M 1061M 1062M 1063M 1064M 1065M 1066M 1067M 1068M 1069M 1070M 1071M 1072M 1073M 1074M 1075M 1076M 1077M 1078M 1079M 1080M 1081M 1082M 1083M 1084M 1085M 1086M 1087M 1088M 1089M 1090M 1091M 1092M 1093M 1094M 1095M 1096M 1097M 1098M 1099M 1100M 1101M 1102M 1103M 1104M 1105M 1106M 1107M 1108M 1109M 1110M 1111M 1112M 1113M 1114M 1115M 1116M 1117M 1118M 1119M 1120M 1121M 1122M 1123M 1124M 1125M 1126M 1127M 1128M 1129M 1130M 1131M 1132M 1133M 1134M 1135M 1136M 1137M 1138M 1139M 1140M 1141M 1142M 1143M 1144M 1145M 1146M 1147M 1148M 1149M 1150M 1151M 1152M 1153M 1154M 1155M 1156M 1157M 1158M 1159M 1160M 1161M 1162M 1163M 1164M 1165M 1166M 1167M 1168M 1169M 1170M 1171M 1172M 1173M 1174M 1175M 1176M 1177M 1178M 1179M 1180M 1181M 1182M 1183M 1184M 1185M 1186M 1187M 1188M 1189M 1190M 1191M 1192M 1193M 1194M 1195M 1196M 1197M 1198M 1199M 1200M 1201M 1202M 1203M 1204M 1205M 1206M 1207M 1208M 1209M 1210M 1211M 1212M 1213M 1214M 1215M 1216M 1217M 1218M 1219M 1220M 1221M 1222M 1223M 1224M 1225M 1226M 1227M 1228M 1229M 1230M 1231M 1232M 1233M 1234M 1235M 1236M 1237M 1238M 1239M 1240M 1241M 1242M 1243M 1244M 1245M 1246M 1247M 1248M 1249M 1250M 1251M 1252M 1253M 1254M 1255M 1256M 1257M 1258M 1259M 1260M 1261M 1262M 1263M 1264M 1265M 1266M 1267M 1268M 1269M 1270M 1271M 1272M 1273M 1274M 1275M 1276M 1277M 1278M 1279M 1280M 1281M 1282M 1283M 1284M 1285M 1286M 1287M 1288M 1289M 1290M 1291M 1292M 1293M 1294M 1295M 1296M 1297M 1298M 1299M 1300M 1301M 1302M 1303M 1304M 1305M 1306M 1307M 1308M 1309M 1310M 1311M 1312M 1313M 1314M 1315M 1316M 1317M 1318M 1319M 1320M 1321M 1322M 1323M 1324M 1325M 1326M 1327M 1328M 1329M 1330M 1331M 1332M 1333M 1334M 1335M 1336M 1337M 1338M 1339M 1340M 1341M 1342M 1343M 1344M 1345M 1346M 1347M 1348M 1349M 1350M 1351M 1352M 1353M 1354M 1355M 1356M 1357M 1358M 1359M 1360M 1361M 1362M 1363M 1364M 1365M 1366M 1367M 1368M 1369M 1370M 1371M 1372M 1373M 1374M 1375M 1376M 1377M 1378M 1379M 1380M 1381M 1382M 1383M 1384M 1385M 1386M 1387M 1388M 1389M 1390M 1391M 1392M 1393M 1394M 1395M 1396M 1397M 1398M 1399M 1400M 1401M 1402M 1403M 1404M 1405M 1406M 1407M 1408M 1409M 1410M 1411M 1412M 1413M 1414M 1415M 1416M 1417M 1418M 1419M 1420M 1421M 1422M 1423M 1424M 1425M 1426M 1427M 1428M 1429M 1430M 1431M 1432M 1433M 1434M 1435M 1436M 1437M 1438M 1439M 1440M 1441M 1442M 1443M 1444M 1445M 1446M 1447M 1448M 1449M 1450M 1451M 1452M 1453M 1454M 1455M 1456M 1457M 1458M 1459M 1460M 1461M 1462M 1463M 1464M 1465M 1466M 1467M 1468M 1469M 1470M 1471M 1472M 1473M 1474M 1475M 1476M 1477M 1478M 1479M 1480M 1481M 1482M 1483M 1484M 1485M 1486M 1487M 1488M 1489M 1490M 1491M 1492M 1493M 1494M 1495M 1496M 1497M 1498M 1499M 1500M 1501M 1502M 1503M 1504M 1505M 1506M 1507M 1508M 1509M 1510M 1511M 1512M 1513M 1514M 1515M 1516M 1517M 1518M 1519M 1520M 1521M 1522M 1523M 1524M 1525M 1526M 1527M 1528M 1529M 1530M 1531M 1532M 1533M 1534M 1535M 1536M 1537M 1538M 1539M 1540M 1541M 1542M 1543M 1544M 1545M 1546M 1547M 1548M 1549M 1550M 1551M 1552M 1553M 1554M 1555M 1556M 1557M 1558M 1559M 1560M 1561M 1562M 1563M 1564M 1565M 1566M 1567M 1568M 1569M 1570M 1571M 1572M 1573M 1574M 1575M 1576M 1577M 1578M 1579M 1580M 1581M 1582M 1583M 1584M 1585M 1586M 1587M 1588M 1589M 1590M 1591M 1592M 1593M 1594M 1595M 1596M 1597M 1598M 1599M 1600M 1601M 1602M 1603M 1604M 1605M 1606M 1607M 1608M 1609M 1610M 1611M 1612M 1613M 1614M 1615M 1616M 1617M 1618M 1619M 1620M 1621M 1622M 1623M 1624M 1625M 1626M 1627M 1628M 1629M 1630M 1631M 1632M 1633M 1634M 1635M 1636M 1637M 1638M 1639M 1640M 1641M 1642M 1643M 1644M 1645M 1646M 1647M 1648M 1649M 1650M 1651M 1652M 1653M 1654M 1655M 1656M 1657M 1658M 1659M 1660M 1661M 1662M 1663M 1664M 1665M 1666M 1667M 1668M 1669M 1670M 1671M 1672M 1673M 1674M 1675M 1676M 1677M 1678M 1679M 1680M 1681M 1682M 1683M 1684M 1685M 1686M 1687M 1688M 1689M 1690M 1691M 1692M 1693M 1694M 1695M 1696M 1697M 1698M 1699M 1700M 1701M 1702M 1703M 1704M 1705M 1706M 1707M 1708M 1709M 1710M 1711M 1712M 1713M 1714M 1715M 1716M 1717M 1718M 1719M 1720M 1721M 1722M 1723M 1724M 1725M 1726M 1727M 1728M 1729M 1730M 1731M 1732M 1733M 1734M 1735M 1736M 1737M 1738M 1739M 1740M 1741M 1742M 1743M 1744M 1745M 1746M 1747M 1748M 1749M 1750M 1751M 1752M 1753M 1754M 1755M 1756M 1757M 1758M 1759M 1760M 1761M 1762M 1763M 1764M 1765M 1766M 1767M 1768M 1769M 1770M 1771M 1772M 1773M 1774M 1775M 1776M 1777M 1778M 1779M 1780M 1781M 1782M 1783M 1784M 1785M 1786M 1787M 1788M 1789M 1790M 1791M 1792M 1793M 1794M 1795M 1796M 1797M 1798M 1799M 1800M 1801M 1802M 1803M 1804M 1805M 1806M 1807M 1808M 1809M 1810M 1811M 1812M 1813M 1814M 1815M 1816M 1817M 1818M 1819M 1820M 1821M 1822M 1823M 1824M 1825M 1826M 1827M 1828M 1829M 1830M 1831M 1832M 1833M 1834M 1835M 1836M 1837M 1838M 1839M 1840M 1841M 1842M 1843M 1844M 1845M 1846M 1847M 1848M 1849M 1850M 1851M 1852M 1853M 1854M 1855M 1856M 1857M 1858M 1859M 1860M 1861M 1862M 1863M 1864M 1865M 1866M 1867M 1868M 1869M 1870M 1871M 1872M 1873M 1874M 1875M 1876M 1877M 1878M 1879M 1880M 1881M 1882M 1883M 1884M 1885M 1886M 1887M 1888M 1889M 1890M 1891M 1892M 1893M 1894M 1895M 1896M 1897M 1898M 1899M 1900M 1901M 1902M 1903M 1904M 1905M 1906M 1907M 1908M 1909M 1910M 1911M 1912M 1913M 1914M 1915M 1916M 1917M 1918M 1919M 1920M 1921M 1922M 1923M 1924M 1925M 1926M 1927M 1928M 1929M 1930M 1931M 1932M 1933M 1934M 1935M 1936M 1937M 1938M 1939M 1940M 1941M 1942M 1943M 1944M 1945M 1946M 1947M 1948M 1949M 1950M 1951M 1952M 1953M 1954M 1955M 1956M 1957M 1958M 1959M 1960M 1961M 1962M 1963M 1964M 1965M 1966M 1967M 1968M 1969M 1970M 1971M 1972M 1973M 1974M 1975M 1976M 1977M 1978M 1979M 1980M 1981M 1982M 1983M 1984M 1985M 1986M 1987M 1988M 1989M 1990M 1991M 1992M 1993M 1994M 1995M 1996M 1997M 1998M 1999M 2000M 2001M 2002M 2003M 2004M 2005M 2006M 2007M 2008M 2009M 2010M 2011M 2012M 2013M 2014M 2015M 2016M 2017M 2018M 2019M 2020M 2021M 2022M 2023M 2024M 2025M 2026M 2027M 2028M 2029M 2030M 2031M 2032M 2033M 2034M 2035M 2036M 2037M 2038M 2039M 2040M 2041M 2042M 2043M 2044M 2045M 2046M 2047M 2048M 2049M 2050M 2051M 2052M 2053M 2054M 2055M 2056M 2057M 2058M 2059M 2060M 2061M 2062M 2063M 2064M 2065M 2066M 2067M 2068M 2069M 2070M 2071M 2072M 2073M 2074M 2075M 2076M 2077M 2078M 2079M 2080M 2081M 2082M 2083M 2084M 2085M 2086M 2087M 2088M 2089M 2090M 2091M 2092M 2093M 2094M 2095M 2096M 2097M 2098M 2099M 2100M 2101M 2102M 2103M 2104M 2105M 2106M 2107M 2108M 2109M 2110M 2111M 2112M 2113M 2114M 2115M 2116M 2117M 2118M 2119M 2120M 2121M 2122M 2123M 2124M 2125M 2126M 2127M 2128M 2129M 2130M 2131M 2132M 2133M 2134M 2135M 2136M 2137M 2138M 2139M 2140M 2141M 2142M 2143M 2144M 2145M 2146M 2147M 2148M 2149M 2150M 2151M 2152M 2153M 2154M 2155M 2156M 2157M 2158M 2159M 2160M 2161M 2162M 2163M 2164M 2165M 2166M 2167M 2168M 2169M 2170M 2171M 2172M 2173M 2174M 2175M 2176M 2177M 2178M 2179M 2180M 2181M 2182M 2183M 2184M 2185M 2186M 2187M 2188M 2189M 2190M 2191M 2192M 2193M 2194M 2195M 2196M 2197M 2198M 2199M 2200M 2201M 2202M 2203M 2204M 2205M 2206M 2207M 2208M 2209M 2210M 2211M 2212M 2213M 2214M 2215M 2216M 2217M 2218M 2219M 2220M 2221M